Actibloc®

- SBR Activated sludge treatment plants for household wastewater, up to 20 PE
- SBR Activated sludge treatment plants for household wastewater, up to 300 PE

SOTRALENTZ
HABITAT

Actibloc® SBR activated sludge treatment plant

The Drulingen factory, France

The Lantaron factory, Spain

The Skierniewice factory, Poland

Summary

ISO 9001 : 2008

- Plastepur® Main Pre-treatment Units, Secondary treatment Units and Accessories are produced under the ISO 9001: 2 008 guarantee of quality

Main Pre-treatment Units conform

- to the Standard EN 12566-1, **CE stamp on septic tanks**
- to the Standard EN 12566-3+A1, **CE stamp on Actibloc®**
- series number engraved on each Main Pre-treatment Units and bar-coded EAN 13.

Protection of the environment

- Beyond improving the quality of wastewater pre-treatment, the primary material used (HDPE VHMW) to fabricate all of our units is 100% recyclable.

Actibloc®: pre-treatment and treatment of household wastewater

4 standard cycles of 6 hours every 24 hours

- **Phase 1** : maximum10 minutes charging reactor chamber with pre-treated wastewater from the settling chamber
- **Phase 2a**: maximum 30 minutes of denitrification,
- **Phase 2b**: intermittent nitrification/oxidation,
- **Phase 3**: maximum 90 minutes of decanting the secondary sludge,
- **Phase 4**: maximum 10 minutes discharge of treated wastewater
- **Phase 5**: maximum 2 minutes pumping of secondary sludge from the reactor chamber back towards the settling chamber.

Pumping phase:

- **Phase 1** : charging reactor chamber with pre-treated wastewater,
- **Phase 2**: discharge of treated wastewater in the surface water system,
- **Phase 3**: pumping of secondary sludge back towards the settling chamber,
- A sensor is not required to start the pump, pumping is completely controlled by the pre-programmed command cabinet.

Oxidation :

- Efficient membrane air diffusers ventilate with fine bubbles to enable a thorough mixing of the entire volume of pre-treated wastewater contained in the reactor chamber.

Assembly

- 4 air tubes to connect to the air compressor (DN150),
- Joints for the 4 air tubes, with 4 different colours,
- The removal of surplus activated sludge is achieved via the junction pipe between the reactor and settling chambers.

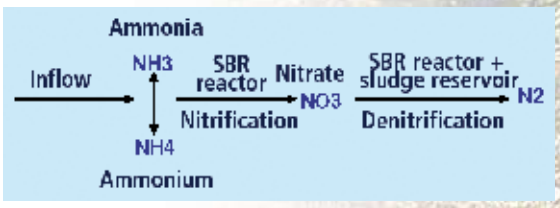
Nitrogen elimination

With additional nitrificatione

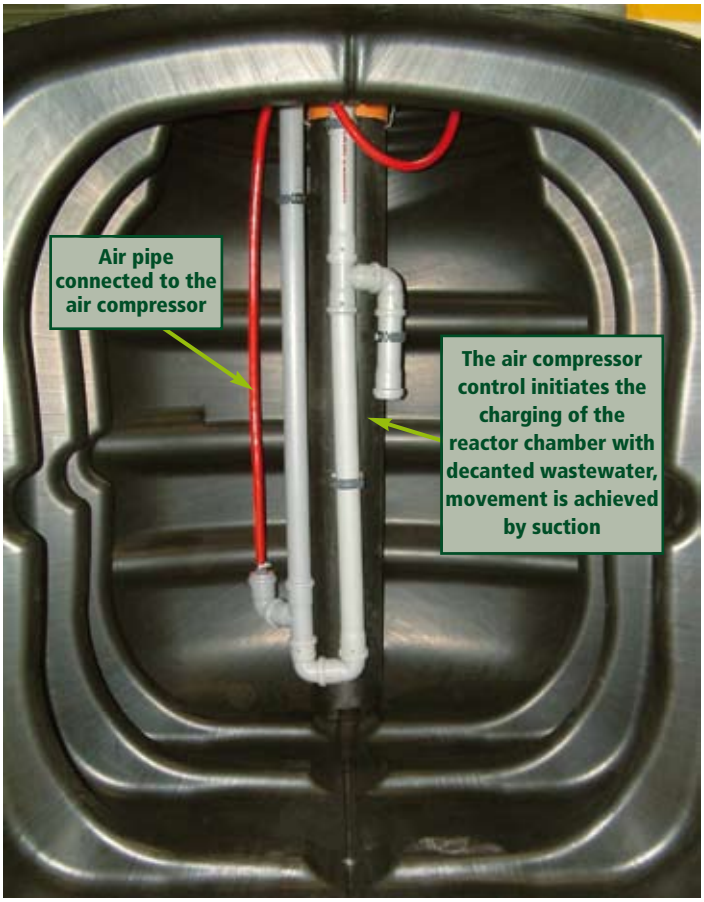
- Treatment of wastewater with activated sludge
- It is essential for intensive oxidation occurs in conjunction

with additional nitrification and denitrification

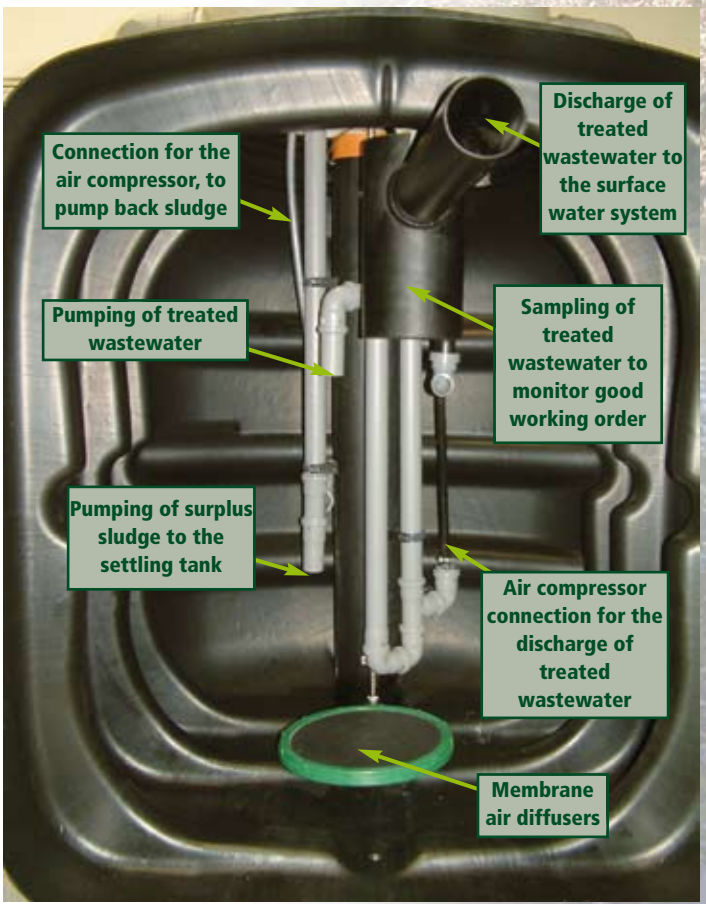
- Treatment of wastewater with activated sludge
- It is essential intensive oxidation occurs in conjunction with sequential pauses



Actibloc® SP IN side Sludge settling chamber, buffering water surges



Actibloc® SP OUT side Sequential Biological Reactor with activated sludge



SOTRALENTZ HABITAT

To what needs does the Actibloc® respond?

Who needs an Actibloc®?

For any user living in a private or co-owned house, in a hotel or on a camping site, with a limited area of land and un-connectable to the mains sewage network, Actibloc® is the ideal solution. A sand filter bed is unnecessary, the burial area is reduced and the two main points to take into account are unequalled efficiency coupled with infrequent maintenance

When to use an Actibloc®?

ACTIBLOC® is a system designed to treat appropriate domestic wastewater, up to 300 PE, **suitable for the pre-treatment and treatment of wastewater from**:

- private houses non-connectable to the mains sewage network,
- hotels non-connectable to the mains sewage network,
- camping sites non-connectable to the mains sewage network,
- small communal estates non-connectable to the mains sewage network

Never for the purposes of treating wastewater from the following:

- restaurants, cafeterias, snack bars, etc. (all food-related businesses),
- milk and cheese processing units, etc. (milk-derived wastewater),
- bakers, cake shops, tea shops, etc. (all flour or starchy products),
- delicatessens, butchers, tripe shops, etc. (all meat production and derivatives),
- fish commerce or industry.

What are the standards and regulations on the Actibloc®?

- The **Standard EN 12 566-3+A1**, May 2009: small wastewater treatment plants up to 50 PE – household wastewater treatment plants ready to use and/or assembled on site.
- After a transition period, these plants will be awarded a CE stamp.
- Abidance of ejection standards are considered to be met when the plant or the activated sludge treatment plant have obtained CE stamp approval, as specified in the **Standard EN 12 566-3+A1**, May 2009

What accreditations does the Actibloc® have?

CE stamp approval by the CSTB (Centre of Scientific and Technical Construction, Nantes) in August 2008 after 42 weeks of trials.
Approval by KLARO EASY N° Z-55 3-69 et Z-55 3-105, stamp obtained in July 2006 by the PIA (Prüf Institut für Abwassertechnik, Aix-la-Chapelle).

What did the CE stamp trials report?

Neither mechanical nor electrical failure during the entire 42-week duration of the tests. All parts of the plant and activated treatment plant revealed to be easily accessible. The activated treatment plant emitted neither noise nor any disagreeable odour.

How Actibloc® SBR activated sludge treatment plant works?

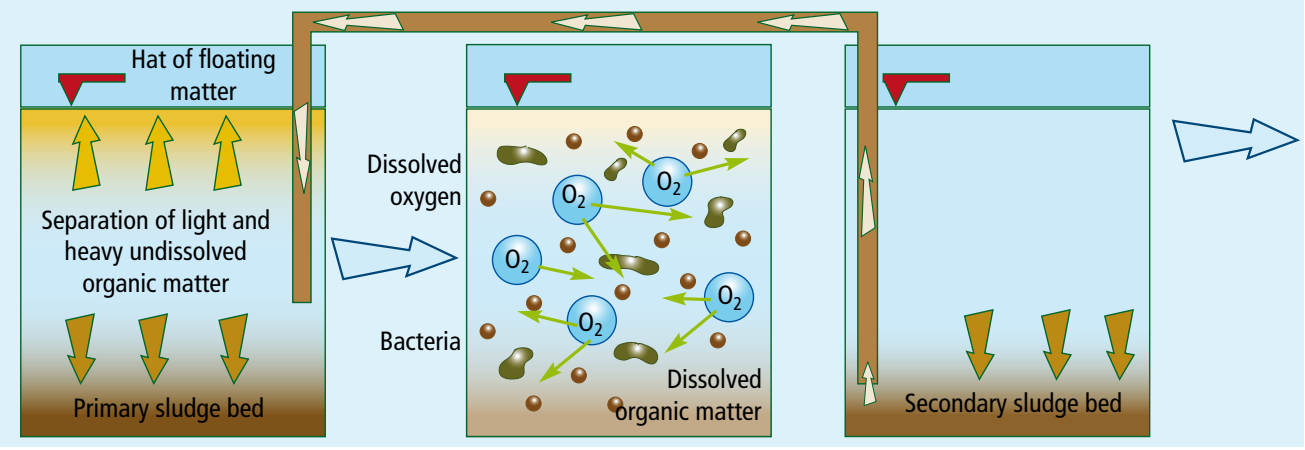
1st step
50% of the volume in a micro-station or an activated sludge purification station

2nd and 3rd step in the same chamber
50% of the volume in a micro-station or an activated sludge purification station

Anaerobic pre-treatment

Aerobic biological treatment

Decanting
Outflow of treated water
Sludge pumped back



Deposit of undissolved organic matter before biological purification

Decomposition of dissolved matter in oxygen rich environment

Deposit of bacterial floc after biological purification

Actibloc®: an SBR micro-station and activated sludge purification station, and tested with a minimum of 300 mg/l DBO5 by the CSTB, CE stamped, destined for the pre-treatment and treatment of household wastewater, reducing pollution by around 97 %.

To what needs does the Actibloc® respond?

What obligations are there?

- The concentration of pollutants in household wastewater treated by small independent treatment units pertaining to the Standard EN 12 566-3+A1, May 2009 must be under the following thresholds:

COD < 150 mg/l	BOD_5 < 35 mg/l	SS < 30 mg/l

- Moreover, CE stamp certification tests validated the following average concentrations during a 24-hour cycle of a working activated sludge treatment plant:

COD < 44 mg/l	BOD < 5 mg/l
NH_4N : 1,1 mg/l	N_{inorg} : 13,8 mg/l
N_{iota} : 25,9 mg/l	MS : 6 mg/l

- The average results showing the reduction of pollutants achieved in a unit working at 100% capacity were:

COD < 92,4 %	BOD < 97,8 %
NH_4N : 96,4 %	SS < 97,0 %

These data are evaluated at temperatures equal to or exceeding 12°C in the biological reactor.

Average activated sludge treatment plant (nominal phase – CE stamp)			
Actibloc®	**SS (mg/l)**	**COD_{total} (mg O_2/l)**	**BOD_5 (mg O_2/l)**
Inlet conc.	350,0	698,0	300,0
Reduction	97 %	92,4 %	97,8 %
Outlet conc.	10,5	53,0	6,6

CE stamp on all Actibloc®

How does it work?

Actibloc® is an activated sludge treatment plant – a Sequential Biological Reactor (SBR) – for the pre-treatment of biodegradable, household wastewater awarded with the CE stamp and including the patented Klaro Easy® system.
Actibloc® works in two phases, in two chambers:

- Settling chamber (50 % of total volume) receives floating matter and buffers water surges
- Biological reactor (50 % of total volume) for the sequential batch treatment of sludge

The settling chamber receiving floating matte rand sludge, has the following functions:

- Decanting primary sludge and collection of secondary sludge from the reactor,
- Separation and retention of sediments and solid floating matter,
- Buffering daily water surges.

The reactor undergoes 4 daily cycles of 6 hours each:

- Oxidation of pre-treated wastewater coming from the settling chamber,
- Decanting sludge after oxidation,
- Discharge of treated water,
- Pumping surplus sludge to the settling tank

However, when the settling chamber level is unchanged at the start of a cycle, the cycle is paused for a 6 hour period, and for a maximum of 3 consecutive cycles, each lasting 6 hours. At the end of these 3 cycles, in cases where the settling tank level has remained unchanged, Actibloc® automatically pumps the volume of water to treat per cycle from the reactor to the settling chamber, thereby avoiding any bacterial degradation,

How often does tank need emptying?

The tests for CE stamp approval revealed that the volume of sludge accumulated clearly represented less than 15% of the settling chamber. The maximum amount of sludge that can be accumulated is 50 % of the useful volume, and as a consequence, tank emptying is required every 3 years, if the Actibloc® has been validated and sized by our technical service. The CSTB is currently testing the periodicity of tank emptying and will finish by July 2010.

What long-distance monitors are there?

Actibloc® is fitted with a modem, which can be run and monitored from a distance.
The user and 2 others can be notified from a distance and in real time of any work to carry out. The CSTB is currently testing the modem long-distance monitors. Subscription and smart card for the telephone line are not included in the modem purchase price.

What adjustments are required?

Actibloc® is optimized before leaving the factory, however manual phases can be integrated to test the whole process. Any process stopped during an electricity cut restarts from the point it stalled when the electricity is reconnected.

What internal monitoring is there?

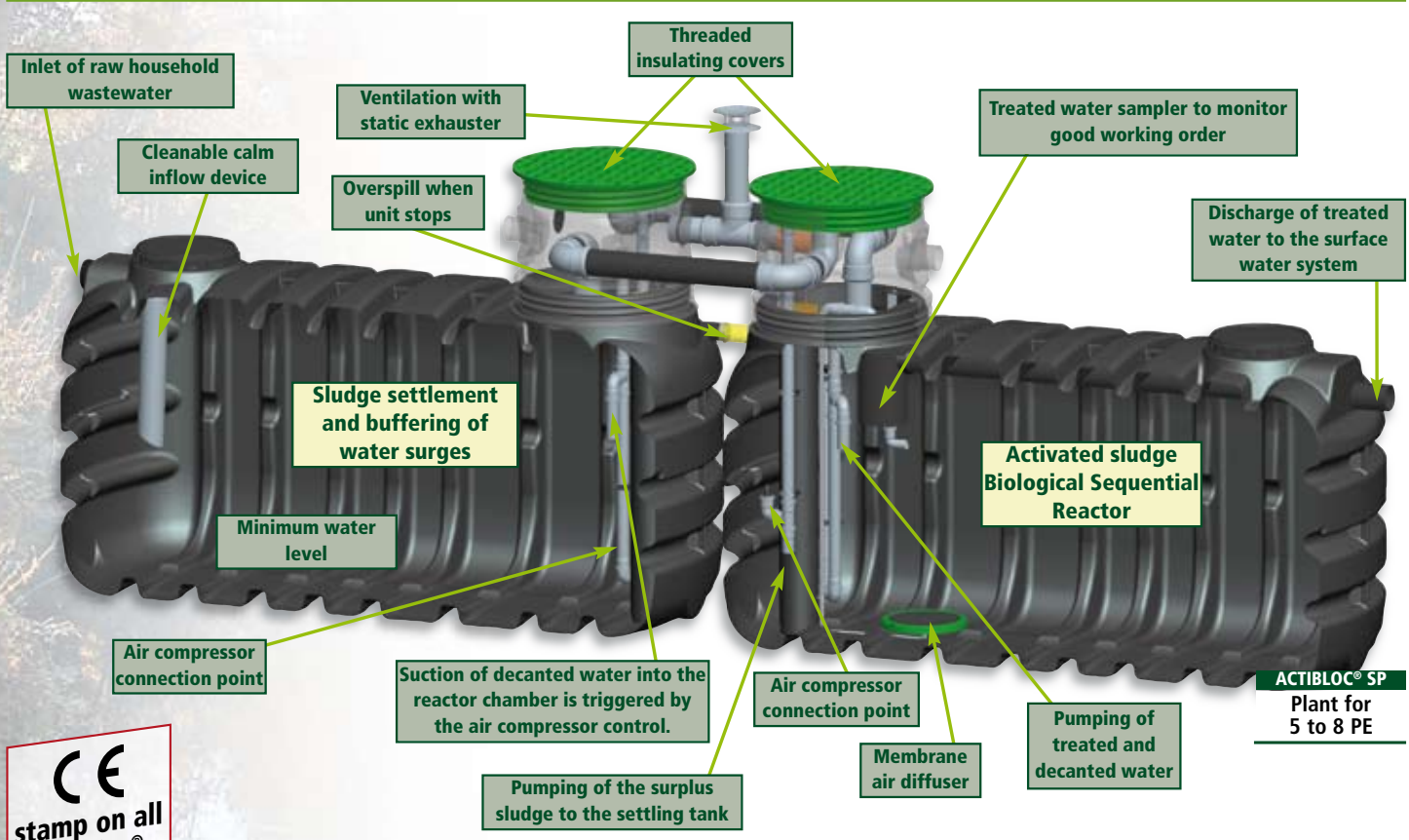
Actibloc® is fitted with a memory card that retraces all operations, incidents and adjustments done.

What is its energy efficiency?

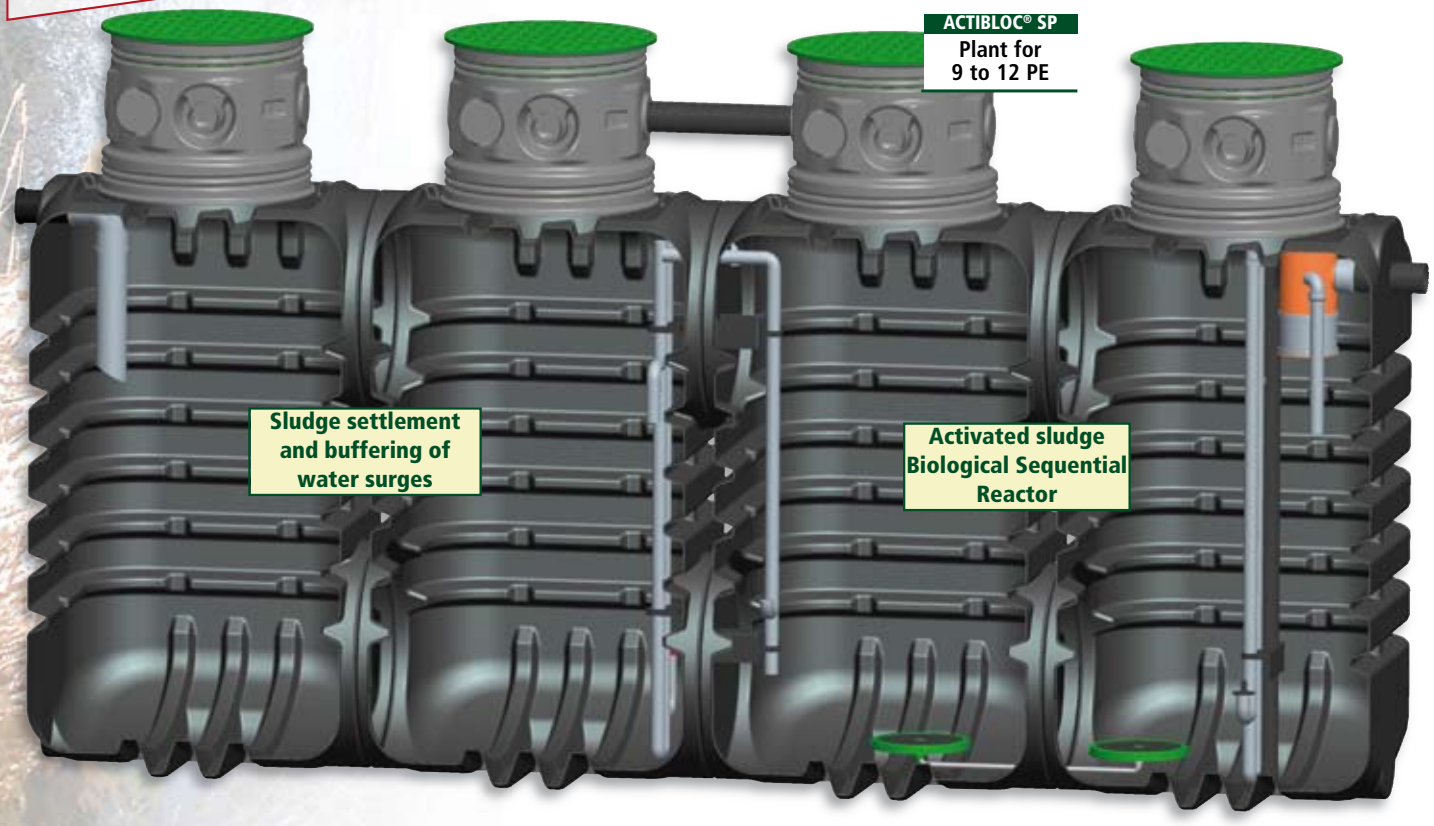
Average consumption of 1.14 kWh/day.

Actibloc® Single Skin tanks for 1 to 12 Population Equivalents

Activated sludge Sequential Biological Plant (SBR) for the treatment of biodegradable household wastewater with patented Klaro Easy® system has achieved the CE mark after passing tests at the CSTB in Nantes.



CE stamp on all Actibloc®



Actibloc® Single Skin tanks for 1 to 12 Population Equivalents

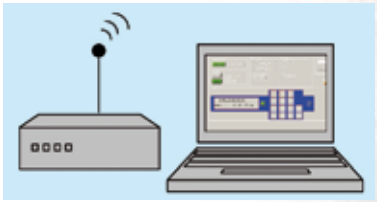
Simplified installation

Thanks to the light-weight, low bulk units and the shallow burial required for Single Skin Actibloc® activated sludge treatment plants, a single mini-digger is all that is needed for installation on restricted land plots.

Standard indoor command cabinet, option sold separately for Actibloc® for 1 to 12 PE, obligatory and sold separately

- Diaphragm air compressor, powerful and quiet,
- Air distributer with 4 solenoid valves,
- Connection points for air pipes (in 4 colours),
- Indoor wall-mounted programmable command cabinet,
- Compact and programmed regulation.

The indoor cabinet cannot be installed when Actibloc® is more than 10 meters from the building it is connected to; where this is the case, an outdoor cabinet must be installed



Long-distance modem monitor

of the control of Actibloc® activated sludge treatment plant, compatible with all models (telephone subscription excluded)
Art SL 33530

Synthetic outdoor command cabinet

Obligatory option, sold separately: watertight, for Actibloc® up to 13 PE

Code	Description	Weight (kg)	Dimensions (cm)	Air compressor power	Modem
32470	cmd cabinet ins Actibloc® max 4 PE	25	50x50x30	64 W	Option
32471	cmd cabinet out Actibloc® max 4 PE	25	36x135x36	64 W	Option
32732	cmd cabinet ins Actibloc® 5 to 8 PE	25	50x50x30	86 W	Option
32733	cmd cabinet out Actibloc® 5 to 8 PE	25	36x135x36	86 W	Option
32734	cmd cabinet ins Actibloc® 9 to 12 PE	30	50x50x30	130 W	Option
32735	cmd cabinet out Actibloc® 9 to 12 PE	35	48x175x34	130 W	Option

Approximate values

Designation	Reference	Population equivalent	Volume, settling chamber	Volume, reactor	Volume, tank or total	Weight	Length	Width	Height	Height, Inlet	Height, Outlet	Diameter, Inlet/Outlet	Indoor cabinet	Outdoor cabinet	Option, modem
	Article	PE	L	L	L	kg	mm	mm	mm	mm	mm	mm	Article	Article	Article
ACTIBLOC® 3500-2500 4PE	32726	1-4	3500	2500	6000	355	4820	1200	1850	1175	1115	110/110	32470	32471	33530
ACTIBLOC® 3500-2500 5-6PE	32727	5-6	3500	2500	6000	355	4820	1200	1850	1175	1115	110/110	32732	32733	33530
ACTIBLOC® 3500-3500 5-8PE	32728	7-8	3500	3500	7000	390	5570	1200	1850	1175	1115	110/110	32732	32733	33530
ACTIBLOC® 10000 SP 9-12PE	32730	9-12	5000	5000	10000	520	4800	1350	2650	1900	1850	110/110	32734	32735	33530

Approximate values

The command cabinet is obligatory, but sold separately

SOTRALENTZ HABITAT

Actibloc® Double Skin tanks up to 13-300 Population Equivalents

Activated sludge Sequential Biological Plant (SBR) for the treatment of biodegradable household wastewater with patented Klaro Easy® system has achieved the CE mark after passing tests at the CSTB in Nantes.

Simplified installation

Thanks to the low weight (50 PE = 2600kg), compact and very high resistance units, a single unloading telescopic crane is sufficient to place the Actibloc® into your pre-prepared ground. With a hydraulic digger and suitable transport, only two (2) days for two (2) people are required to install and start the Actibloc®.

Code	Description	Weight (kg)	Dimensions (cm)	Air compressor power	Modem
32735	cmd cabinet out Actibloc® 9 to 18 PE	35	48x175x34	130 W	Option
33810	cmd cabinet out Actibloc® 20 to 18 PE	355	81x110x64	230 W	Included
33811	cmd cabinet out Actibloc® 28 to 40 PE	365	81x110x64	440 W	Included
33812	cmd cabinet out Actibloc® 45 to 50 PE	510	132x110x64	800 W	Included

Approximate values

Concrete command cabinets Outdoor, watertight, for 13 to 50 PE

- Diaphragm air compressor, powerful and quiet,
- Air distributor with 4 solenoid valves,
- Connection points for air pipes (in 4 colours),
- Outdoor programmable command cabinet,
- Compact and programmed regulation

Options sold separately

- For the Actibloc® from 13 to 18 PE: Art. 33 735
- For the Actibloc® from 20 to 25 PE: Art. 33 810 A
- For the Actibloc® from 28 to 40 PE: Art. 33 811
- For the Actibloc® from 41 to 50 PE: Art. 33812 B

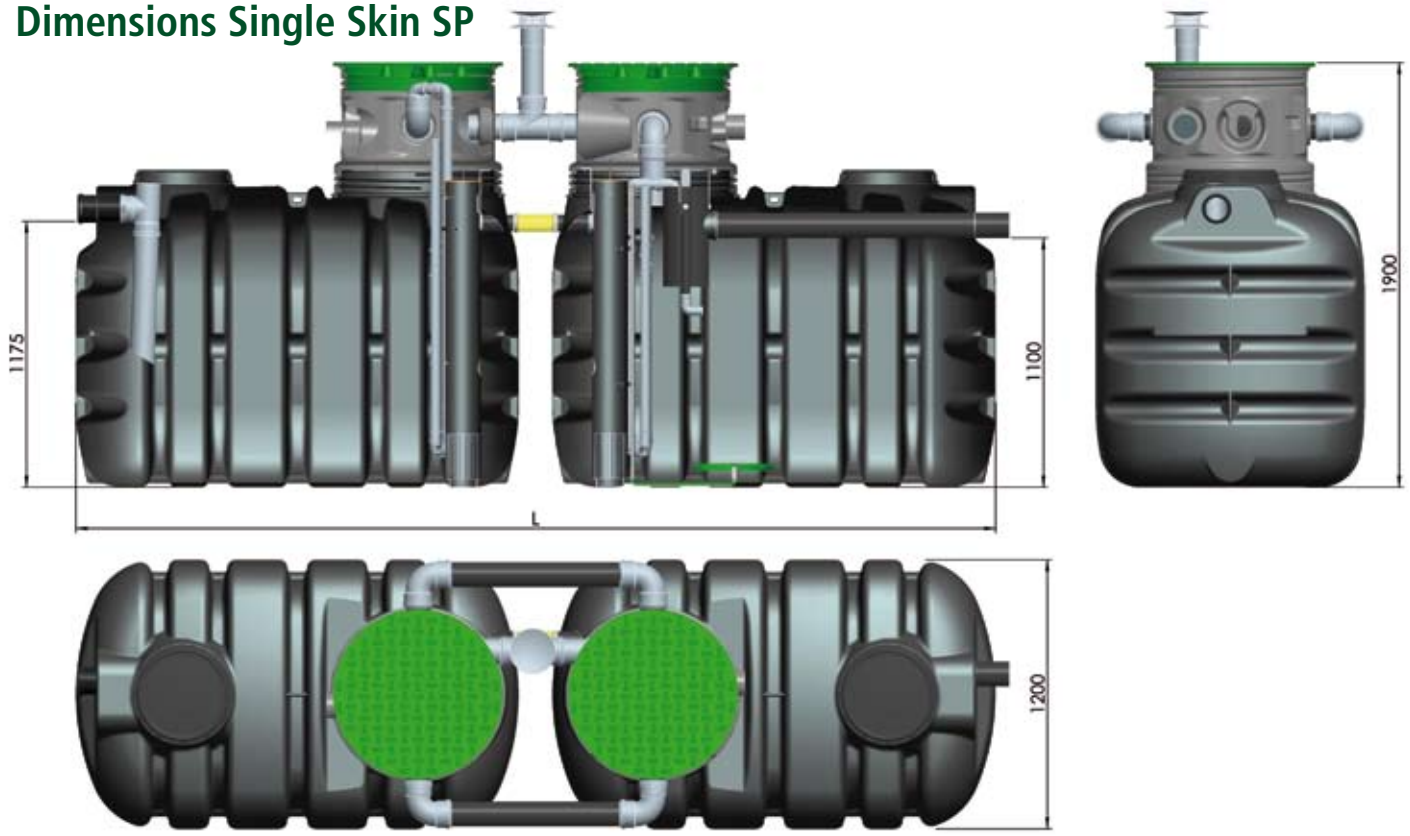
Description	Reference	Population equivalent	Volume, settling chamber	Volume, reactor	Volume, tank or total	Weight	Length	Width	Height	Height, Inlet	Height, Outlet	Diameter, Inlet/Outlet	Outdoor plastic command cabinet, obligatory but sold separately	Outdoor concrete command cabinet, obligatory but sold separately	Option, integrated modem, but sold separately with telephone subscription
	Article	PE	L	L	L	Kg	cm	cm	cm	cm	cm	mm	Article	Article	Article 33530
ACTIBLOC® 12 000 DP 15PE	33626	13-15	6000	6000	12000	870	505	204	260	177	174	160/160	32735		option
ACTIBLOC® 14 000 DP 16PE	33627	16	6500	7500	14000	1070	587	204	260	177	174	160/160	32735		option
ACTIBLOC® 16 000 DP 18PE	33629	17-18	8000	8000	16000	1155	640	204	260	177	174	160/160	32735		option
ACTIBLOC® 18 000 DP 20PE	33630	19-20	8500	9500	18000	1265	726	204	260	177	174	160/160		33810	included
ACTIBLOC® 19 000 DP 25PE	33631	21-25	9500	9500	19000	1345	780	204	260	177	174	160/160		33810	included
ACTIBLOC® 22 000 DP 28PE	33632	26-28	11 000	11 000	22000	1540	916	204	260	177	174	160/160		33811	included
ACTIBLOC® 25 000 DP 32PE	33633	29-32	11 500	13 500	25000	1710	998	204	260	177	174	160/160		33811	included
ACTIBLOC® 27 000 DP 35PE	33634	33-35	13 500	13 500	27000	1765	1080	204	260	177	174	160/160		33811	included
ACTIBLOC® 30 000 DP 40PE	33635	36-40	14 000	16 000	30000	1930	1162	204	260	177	174	160/160		33811	included
ACTIBLOC® 35 000 DP 45PE	33636	41-45	17 500	17 500	35000	2235	1344	204	260	177	174	160/160		33812	included
ACTIBLOC® 40 000 DP 50PE	33637	46-50	19 000	21 000	40000	2600	1585	204	260	177	174	160/160		33812	included
ACTIBLOC® 55 000 DP 75PE	33885	75	27 500	27 500	55000	3530	1082	460	260	177	174	160/160		33924	included
ACTIBLOC® 70 000 DP 100PE	33913	100	35 000	35 000	70000	4470	1340	460	260	177	174	160/160		33925	included
ACTIBLOC® 80 000 DP 125PE	33914	125	40 000	40 000	80000	5200	1585	460	260	177	174	160/160		33926	included
ACTIBLOC® 100 000 DP 150PE	33915	150	50 000	50 000	100 000	6320	1950	460	260	173	170	200/200		33926	included
ACTIBLOC® 120 000 DP 175PE	33916	175	60 000	60 000	120 000	7720	2424	460	260	173	170	200/200		33927	included
ACTIBLOC® 140 000 DP 200PE	33917	200	70 000	70 000	140 000	8940	2780	460	260	173	170	200/200		33927	included
ACTIBLOC® 160 000 DP 250PE	33918	250	80 000	80 000	160 000	10400	327	460	260	173	170	200/200		33928	included
ACTIBLOC® 200 000 DP 300PE	33919	300	100 000	100 000	200 000	12640	4000	460	260	173	170	200/200		34121	included
ACTIBLOC® 240 000 DP 350PE	33920	350	120 000	120 000	240 000	15440	2424	970	260	173	170	200/200		34122	included
ACTIBLOC® 280 000 DP 400PE	33921	400	140 000	140 000	280 000	17880	2780	970	260	173	170	200/200		34122	included
ACTIBLOC® 320 000 DP 450PE	33922	450	160 000	160 000	320 000	20800	3270	970	260	173	170	200/200		34122	included
ACTIBLOC® 400 000 DP 500PE	339223	500	200 000	200 000	400 000	25280	4000	970	260	173	170	200/200		34123	included

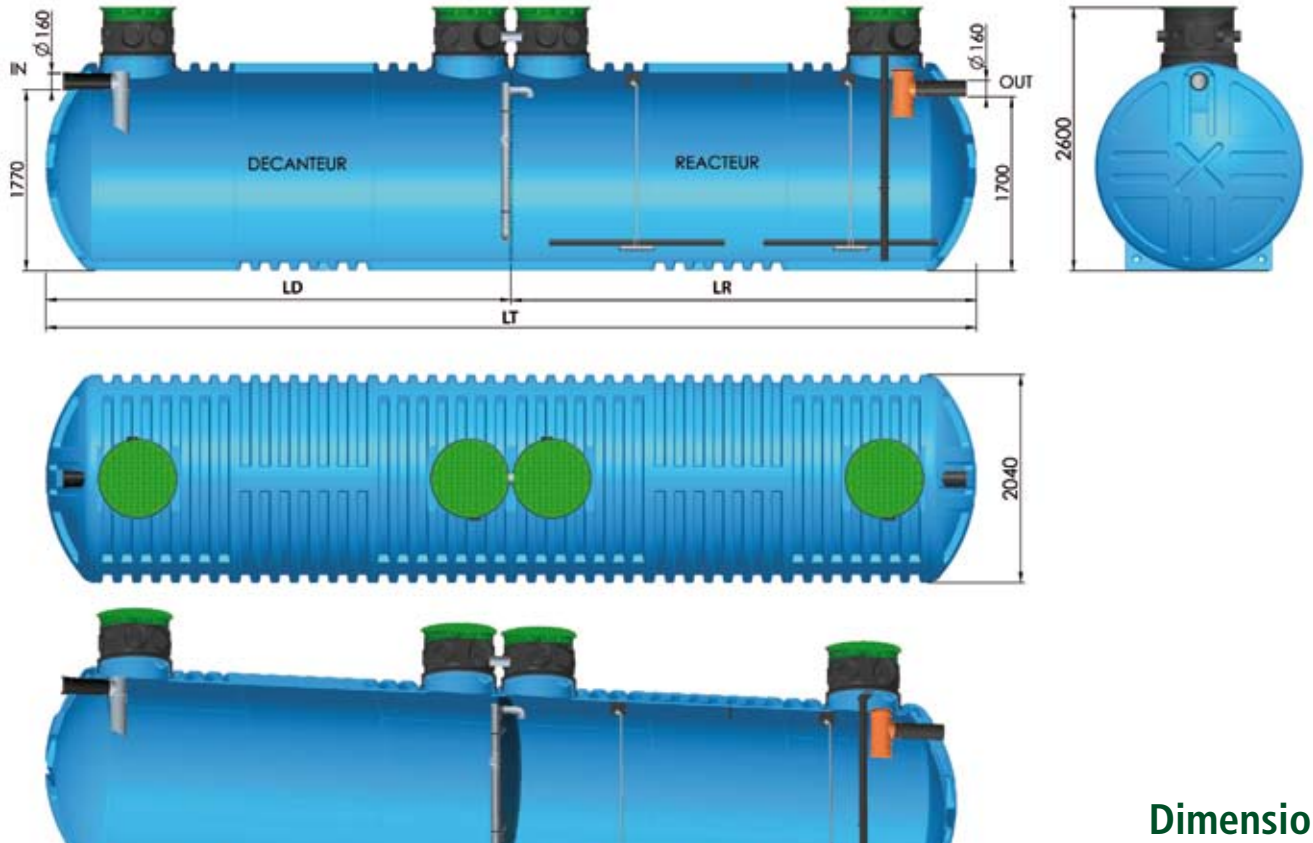
Approximate values




Actibloc® Dimensions

Dimensions Single Skin SP



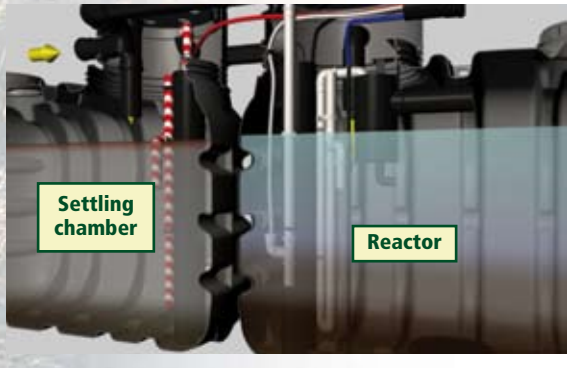


Dimensions Double Skin DP

Actibloc®: treatment in 5 phases

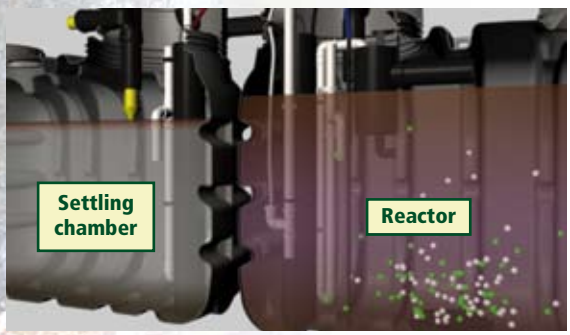
Phase 1: supply

- Household wastewater, temporarily stored and pre-treated in the settling chamber, is moved to the reactor chamber under the action of a compressed air system. As a result of this specially designed compressed air system, a minimum water level in the settling chamber is ensured, without resorting to a floating sensor or other technical solutions
- The reactor can only receive pre-treated wastewater that does not contain solid bodies, sediments or floating matter



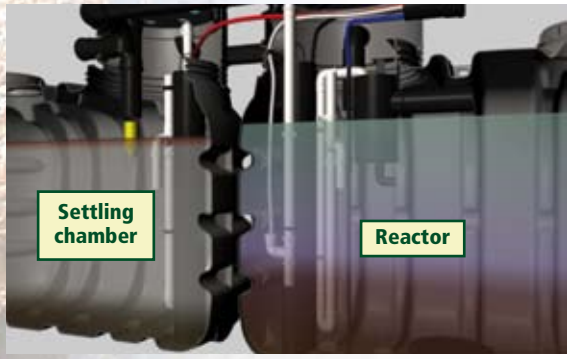
Phase 2: oxidation

The pre-treated wastewater undergoes oxidation by action of a membrane tubular air diffuser. Microorganisms are supplied with oxygen, indispensable for the biochemical degradation of pollutants contained in the pre-treated wastewater. Injected air initiates the complete mixing of water contained in the reactor. The oxidation system is controlled by an outdoor control regulator, which ensures the supply of ambient air. Air is brought in by means of an air compressor, enabling intermittent oxidation cycling.



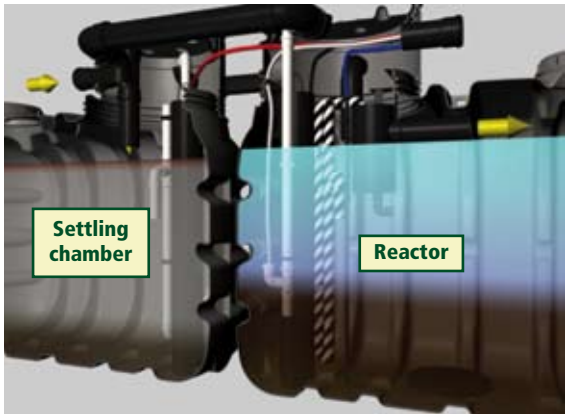
Phase 3: sedimentation

At the end of phase 2, the reactor goes into standby and the activated sludge can deposit by sedimentation on the bottom of chamber. A zone of clear treated water forms in the upper part of the reactor chamber at the same time as the secondary sludge bed forms on the bottom.



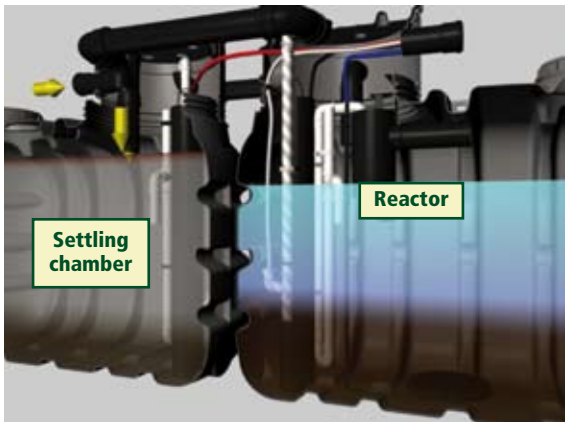
Phase 4: discharge of treated water

The treated water, biologically cleaned and with no activated sludge, is discharged from the reactor by a compressed air pumping system. A special device for the pumping of treated water is used to ensure a minimum water level in the reactor, without resorting to a floating sensor or other technical solutions



Phase 5: pumping secondary sludge

Excess secondary sludge is returned to the settling chamber by a pump system. Surplus sludge accumulated on the bottom of the reactor is sucked up. Once this process is finished, the cycle starts again at phase 1.



- As a general rule, there are 4 such operational cycles per day.
- Individual adaptation of operational time and number of cycles to increase the treatment yield is possible by contacting the manufacturer. Only a qualified, authorised specialist ought to make such modifications.
- It is equally possible to manually set the unit to "pause" mode. During the pause period, only the oxidation system at the heart of the SBR reactor remains intermittently operational.
- Sewage treatment plants operate by means of a microprocessor control system. These microprocessors regulate the transport of air with solenoid valves. The regulator, air compressor and the solenoid valves are found in the control box.
- Any fault that occurs is signalled by the visual and acoustic alarm
- A regular manual servicing of sludge, floating matter and good working order of the system is possible
- The reactor is fitted with a sampling compartment in order to monitor the quality of the discharged treated water

Actibloc® : start-up, performance and maintenance

Installation

The Actibloc® is designed to pre-treat and treat non-industrial, household wastewater that is unable to be discharged into the mains sewage network. For hotels, and restaurants, settling tanks and grease extractors are obligatory. It is impossible to install Actibloc® in milk and cheese processing units, bakers, fish mongers...

Start up

By appointment a SOTRALENTZ-HABITAT technician will come and start up each ACTIBLOC® plant.

Modem (option sold separately)

- Communication by cable or by GSM modem
- Reading diagnostic protocol
- Long-distance communication by ZAPF-GSM modem
- SMS alert for every fault
- Long-distance control of all installations from your desk.

Long-distance control

- Microprocessor
- Program works automatically and in real time
- Platforms for the operator and for maintenance (under code protection)
- Group control (for energy consumption)
- Important parameters work independently of the grid
- Ample log book to record hours of work and fault reports
- Serial port for reading dates or external transmissions
- Grid disconnection alarm (with 9V battery)
- With temperature probe
- With pressure probe for the automatic detection of reduced load

Automatic detection of reduced load

- The pressure probe in the cabinet determines the level in the sludge chamber with an air pipe to the supply lever.
- If the inflow is attenuated, a pause cycle is automatically initiated. => Resulting in considerable savings in energy.

Compressed air in the SBR

- Accumulative process resistant to hydraulic shocks
- Oxidation is carried out by the air compressor and oxidation membrane
- Minimal energy costs
- No electrical part in contact with water
- No float switch or floating sensor
- Extremely safe to use
- Easy maintenance
- Microprocessors are programmable individually

Inspections

- Measure sludge height in the chamber. If sludge height reaches 70 % of the volume of the settling chamber, organise the removal of sludge contained uniquely in the installation: settling chamber and reactor;
- Measure O_2 concentration in the sampling compartment urs (> 2 mg/l);
- Check the volume of sludge in the SBR reactor (< 400 ml/l);
- Take a discharge sample and analyse the COD in the laboratory (if the responsible authority demands this).

We recommend two (2) inspections per year undertaken by a SOTRALENTZ-HABITAT technician or by a business authorised by SOTRALENTZ-HABITAT

Power to the installation must never be switched off as there wouldn't be any oxygen for the bacteria.

The following non-biological products are not recommended to be put through the plant:

- Rainwater from roofs or courtyards.
- Other sources of water (e.g. drainage)
- Farm animal waste, both solid and liquid,
- Wastewater originating from businesses or agriculture, even if it is indistinguishable from household wastewater
- Chemicals, drugs, mineral oils and solvents,
- Cooling water,
- Solid matter in the from of food left-overs, plastics, health and beauty products, coffee filters, bottle corks and other household products
- Milk and dairy products,
- Water discharged from swimming pools,
- Blood in large quantities.

When confronted with large quantities of grease, it is recommended to pre-treat the household wastewater with a Grease Extractor.

Emptying

- Check the sludge levels in the settling chamber,
- If sludge level reaches 50 % of the settling tank volume, the chamber must be emptied.
- However, the Actibloc® settling chamber has a safety zone enabling maximum storage equivalent to 70 % of its volume.
- If the water level is insufficient, emptying the settling chamber becomes indispensable,
- The exclusive emptying of the settling chamber must be carried out by a qualified business.

Maintenance

- Check the good working order of the oxidation process and levers with the control and inside the tank
- Check the air filters in the cabinet,
- Maintenance of the air compressor

Lid of settling chamber, view from above

Lid of reactor, view from above

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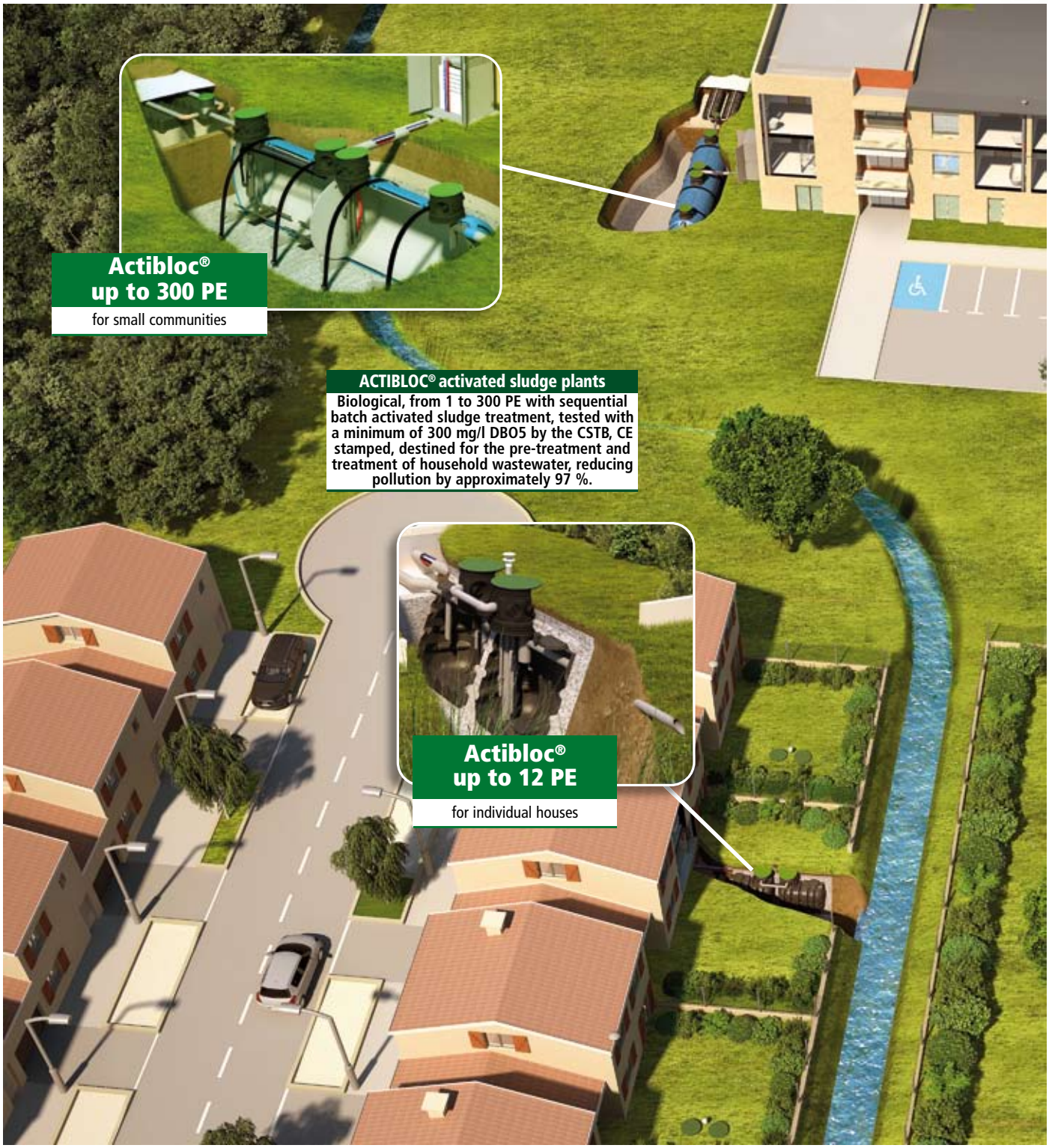
CE stamp on all Actibloc®

Actibloc®



DISTRIBUTOR

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